

WHAT IS CLAIMED IS:

1. A thermoelectric material which is represented by the following composition formula (1) and comprises as a major phase an MgAgAs type crystal structure:

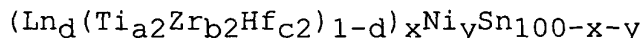
5 $(\text{Ti}_{a1}\text{Zr}_{b1}\text{Hf}_{c1})_x\text{Ni}_y\text{Sn}_{100-x-y}$
composition formula (1);
(wherein a_1 , b_1 , c_1 , x and y satisfy the conditions of: $0 < a_1 < 1$, $0 < b_1 < 1$, $0 < c_1 < 1$, $a_1 + b_1 + c_1 = 1$, $30 \leq x \leq 35$ and $30 \leq y \leq 35$).

10 2. The thermoelectric material according to claim 1, wherein Ti, Zr and Hf in said composition formula (1) are partially replaced by at least one element selected from the group consisting of V, Nb, Ta, Cr, Mo and W.

15 3. The thermoelectric material according to claim 1, wherein Ni in said composition formula (1) is partially replaced by at least one element selected from the group consisting of Mn, Fe, Co and Cu.

20 4. The thermoelectric material according to claim 1, wherein Sn in said composition formula (1) is partially replaced by at least one element selected from the group consisting of As, Sb, Bi, Ge, Pb, Ga and In.

25 5. A thermoelectric material which is represented by the following composition formula (2) and comprises as a major phase an MgAgAs type crystal structure:



composition formula (2);

(wherein Ln is at least one element selected from the group consisting of Y and rare earth elements;

5 and a_2 , b_2 , c_2 , d , x and y satisfy the conditions of:

$$0 \leq a_2 \leq 1, 0 \leq b_2 \leq 1, 0 \leq c_2 \leq 1, a_2 + b_2 + c_2 = 1, 0 < d \leq 0.3,$$

$$30 \leq x \leq 35 \text{ and } 30 \leq y \leq 35).$$

6. The thermoelectric material according to claim 5, wherein Ti, Zr and Hf in said composition
10 formula (2) are partially replaced by at least one element selected from the group consisting of V, Nb, Ta, Cr, Mo and W.

7. The thermoelectric material according to claim 5, wherein Ni in said composition formula (2) is
15 partially replaced by at least one element selected from the group consisting of Mn, Fe, Co and Cu.

8. The thermoelectric material according to claim 5, wherein Sn in said composition formula (2) is
20 partially replaced by at least one element selected from the group consisting of As, Sb, Bi, Ge, Pb, Ga and In.

9. A thermoelectric material which is represented by the following composition formula (3) and comprises as a major phase an MgAgAs type crystal structure:



(wherein Ln1 is at least one element selected from the group consisting of Sc, Y, Gd, Tb, Dy, Ho, Er, Tm,

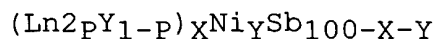
Yb, Lu, Th and U; and X and Y satisfy the conditions of: $30 \leq X \leq 35$ and $30 \leq Y \leq 35$, respectively).

10. The thermoelectric material according to claim 9, wherein Ln1 in said composition formula (3) is
5 partially replaced by at least one element selected from the group consisting of Ti, Zr, Hf, La, Ce, Pr, Nd, Sm, Eu, Be, Mg, Ca, Sr and Ba.

11. The thermoelectric material according to claim 9, wherein Ni in said composition formula (3) is
10 partially replaced by at least one element selected from the group consisting of V, Nb, Ta, Cr, Mo, W, Mn, Fe, Co, Rh, Ir, Pb, Pt, Cu, Ag, Au and Zn.

12. The thermoelectric material according to claim 9, wherein Sb in said composition formula (3) is
15 partially replaced by at least one element selected from the group consisting of Al, Si, Ga, Ge, As, In, Sn, Pb and Bi.

13. A thermoelectric material which is represented by the following composition formula (4) and comprises
20 as a major phase an MgAgAs type crystal structure:



composition formula (4);

(wherein Ln2 is at least one element selected from the group consisting of Sc, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th and U; and p, X and Y satisfy the conditions of:
25 $0.001 \leq p \leq 0.999$, $30 \leq X \leq 35$ and $30 \leq Y \leq 35$, respectively).

14. The thermoelectric material according to

claim 13, wherein Ln₂ in said composition formula (4) is partially replaced by at least one element selected from the group consisting of Ti, Zr, Hf, La, Ce, Pr, Nd, Sm, Eu, Be, Mg, Ca, Sr and Ba.

5 15. The thermoelectric material according to claim 13, wherein Ni in said composition formula (4) is partially replaced by at least one element selected from the group consisting of V, Nb, Ta, Cr, Mo, W, Mn, Fe, Co, Rh, Ir, Pb, Pt, Cu, Ag, Au and Zn.

10 16. The thermoelectric material according to claim 13, wherein Sb in said composition formula (4) is partially replaced by at least one element selected from the group consisting of Al, Si, Ga, Ge, As, In, Sn, Pb and Bi.

15 17. A thermoelectric element comprising: p-type thermoelectric material and n-type thermoelectric material, both of which are alternately connected with each other in series, wherein the n-type thermoelectric material comprises the thermoelectric material claimed
20 in Claim 1.

 18. A thermoelectric element comprising: p-type thermoelectric material and n-type thermoelectric material, both of which are alternately connected with each other in series, wherein the n-type thermoelectric
25 material comprises the thermoelectric material claimed in Claim 5.

 19. A thermoelectric element comprising: p-type

thermoelectric material and n-type thermoelectric material, both of which are alternately connected with each other in series, wherein the p-type thermoelectric material comprises the thermoelectric material claimed
5 in Claim 9.

20. A thermoelectric element comprising: p-type thermoelectric material and n-type thermoelectric material, both of which are alternately connected with each other in series, wherein the p-type thermoelectric
10 material comprises the thermoelectric material claimed in Claim 13.